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THE IMPACT OF RETAIL WHEELING ON TAX REVENUES IN TEXAS

An Economic and Policy Analysis
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EXECUTIVE SUMMARY

This report assesses the impact on certain tax revenues in Texas if the electric utility industry of the state is opened up in the near term to retail competition, commonly known as "retail wheeling." This is an important component of the retail wheeling debate because electric utilities have long been recognized as reliable sources of revenue for state, city and other local forms of government, including the state's school districts. Fundamental changes brought about by electric deregulation at the retail level would have a dramatic effect on the way in which a considerable amount of government revenue is collected in this state.

Significant tax-related public policy issues will have to be dealt with prior to any transition to retail wheeling in Texas; if not, local governments and the State of Texas will experience substantial revenue losses from a variety of taxes and fees. This report quantifies the potential for this tremendous loss in revenues from the following government revenue streams in Texas:

- retail sales taxes;
- utility gross receipts taxes;
- local utility franchise fees;
- state franchise taxes; and
- local property taxes.

Section II of this report, immediately following the executive summary, presents a more detailed account of the traditional role electric utilities have played in the tax structure of the state and local governments, and provides a detailed description of the taxes and fees that are uniquely paid by electric utilities in Texas.

Section III presents estimates of the potential effects of retail wheeling on individual tax revenue streams collected in Texas. The section contains descriptions of the taxes that will be affected by retail wheeling, and an estimate of the revenue loss from each tax to the State of Texas over a ten year period.

Section IV provides a detailed description of the methodology used to conduct this study, including a description of the Texas Economic Impact Analysis Module, which was developed for use in a June 1996 report to assess the economic impact in the state from a near term transition to retail wheeling. The approach used to develop the findings of this report using that model, as well as additional tools used for this analysis are also discussed.

Public Policy Issues

Increasing competition at the retail level in the provision of electricity will create a number of problems, or at the least raise a number of public policy issues that must be dealt with, regarding government revenue collection in Texas, such as:

- The negative economic impact of higher electrical rates for residential and small commercial customers, brought on by a rapid transition to retail wheeling, will decrease economic activity in the state, and thereby reduce taxes paid by consumers and businesses.

- Unless there are significant tax law changes, market share is likely to shift from regulated utilities, who pay more in taxes, to less heavily taxed electric providers. This uneven playing field in a competitive environment will decrease the value of property belonging to currently regulated providers, who often made expensive capital investments to produce electricity, based on requirements of the regulated process. These decreased property values will lead to decreased revenues for Texas governments.

- There will be a shift in market share to lower cost providers which typically provide power from newer and smaller facilities that are less costly and thus have lower overall property value assessments.

- In an unregulated environment, utilities will increasingly take actions to minimize the amount of taxes they must pay. This means utilities

may purchase power from lower cost plants or from sources that have not been as heavily taxed by states or localities, possibly outside the current political subdivision for which they currently collect revenue. This may lead to reduced revenue collections to certain Texas political subdivisions, and the state itself.

- If there continues to be taxes specifically imposed upon providers of electrical power, there may need to be a new definition created for what constitutes a "utility" or electric power producer, since there will be sources of electrical power other than the traditional utilities. Tax collectors will need new guidelines to determine what entities to tax as electric providers.

- Certain school districts could lose substantial portions of their property tax base if investor owned generating plants lose value in a competitive market environment. Not only will the effect on these districts be dramatic, but there could be a ripple effect throughout the state's school equalization funding system in reaction to these local revenue losses.

- Local franchise taxes, currently paid by utilities to local governments for the right to use the municipality's streets and alleys, will have to be adjusted to deal with multiple providers of electric power.

Estimated Government Revenue Losses

The study shows that if retail wheeling is introduced in the State of Texas:

- There could be a loss to the state in retail sales tax revenues, based on decreased economic activity, of up to $58 million in its first full year, up to $106 million in the second year, and as much as $166 million in the tenth year.

- There could be a loss to the state in utility gross receipts tax for the state of up to $16 million in the first full year of retail wheeling, up to $27 million in the second year, and up to $95 million in the tenth year.

- There could be a loss in local franchise fees to local governments across Texas, based on current agreements, of up to $33 million in the first year, up to $55 million in the second year and up to $196 million in the tenth year.

- There could be a loss in state franchise taxes of up to $7 million in the first full year of retail wheeling, up to $12 million in the second year and up to $25 million in the tenth year.

And perhaps most significant,

- There could be a loss in property tax revenues to local governments across Texas, based on the Public Utility Commission's mid-range estimate of the expected value of reduced property tax assessments of utility assets of up to $121 million in the first year, up to $181 million in the second year, and up to $242 million in the tenth year.

The total government revenue impact for all Texas governments could be quite substantial, with total tax and fee revenue losses estimated relatively conservatively at $234 million in the first year, $382 million in the second year, $600 million in the fifth year, and growing to $724 million in the tenth year of retail wheeling, with a ten year cumulative total of loss revenues, using certain mid-range estimates, of as much as $5.7 billion.

Potential Effect of Retail Wheeling on Total Tax Revenues
(all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
LOW CASE	-144	-246	-346	-389	-425	-459	-485	-507	-528	-543	-4072
MID CASE	-234	-382	-504	-558	-600	-638	-665	-688	-709	-724	-5702
HIGH CASE	-314	-502	-644	-708	-755	-797	-825	-848	-869	-884	-7146

Source: Texas Economic Impact Analysis Module, 1996.

Previous Analysis of the Economic Impact of Retail Wheeling

As noted above, this study builds upon an earlier study produced in June of 1996, entitled *The Potential Economic Impacts of Retail Competition in the Electric Utility Industry in Texas*, developed by Texas Perspectives, Inc. and MGT of America, Inc. For this study, MGT used the economic model that was developed for that report, and sought important technical assistance from Dr. Jared E. Hazleton of Texas A&M University, and Dr. Brian O'Connor, Managing Director of Ridgewood Economic

Associates and former Chief Domestic Economist for the IBM Corporation, to develop the government revenue analysis contained herein.

The earlier report concluded that the average Texas household would experience significantly increased electricity bills for the first several years following the introduction of retail wheeling, peaking in the fourth year at an increase of about $28 per month. The report estimated that from 1997 to 2007, residential and small commercial rates would increase 4.7% per year, for a total increase of 66.6% over the ten year period, while commercial rates would decrease about 1.6% per year, down a total of 11.6% for the period. Industrial rates would decrease 3.6% per year, or decline a total of 33.3% during the ten year period.

The June 1996 report based its rate calculations on the observation that the deregulation of a number of industries showed deregulation is rarely a quick and complete transition to competition. More importantly, the results of competition affect various groups of customers differently. One of the industries examined, the telecommunications industry, seemed to have useful parallels to the electric industry, which is why it was used as a significant guide in development of the model used in the previous report to estimate changes in electric rates following deregulation.

Given the similarities between the telecommunications and electric utility industries, and the pattern of price increases for local telephone service when the Bell System was broken up, it was reasonable to use that historical data as a significant factor driving the assumptions made in the June 1996 report: large industrial customers will benefit from retail wheeling of electricity before residential customers do. In

addition, Texas households actually will experience a rate increase as a result of retail wheeling.

The June 1996 report developed an economic impact model that took into account estimated rate changes, and determined the effect of these changes in total economic activity for Texas. The specific variables and factors used for the June 1996 report are discussed in detail at the end of this report. The basis for that analysis was built on three economic performance measures:

- employment;
- gross state product in constant 1987 dollars (real output); and
- current dollar gross state product (nominal output).

The logic of the model used to develop estimates regarding changes in these economic factors is relatively simple. A baseline forecast of prices that assumed no retail wheeling, organized by the three customer classes mentioned above, residential and small commercial, commercial and industrial, was developed through 2007. An alternative forecast of electric prices with retail wheeling was then developed, using the recent history and experiences of other deregulated industries, namely telecommunications, as a guide. The negative impact on households, due to increased electric rates during the initial years of retail wheeling and a corresponding decrease in disposable income to spend on other things, translates into an overall negative effect on the Texas economy.

The broader economic impact findings of the June 1996 report were based on the fact that utility costs are a key factor for all sectors of the economy. In essence, the economic model used in the previous report found that the benefits of lower industrial electricity prices that might be expected with retail wheeling are more than offset by the

reduction in consumer disposable income, leading to overall decreased economic activity in the state.

The economic impact of a relatively quick transition to retail wheeling in Texas could be significant. The June 1996 report estimated that about 27,700 jobs would be lost in the first year of retail wheeling, with almost 50,000 jobs lost by the third year. The gross state product could decrease by $2.4 billion in the first year, adjusted for inflation, and up to $4.3 billion could be lost in the third year.

Conclusion

Retail competition in the electric industry upsets the traditional tax climate in which state and local governments, including school districts, count on the significant stable values of utility facilities (stability and investment driven by the "regulatory compact"[1] that permits full cost recovery of prudently made investments), and the regulated character of the industry that makes it an ideal "tax collector" for all levels of government.

Decreases in government revenue from a transition to retail wheeling will be caused by a number of factors:

- The negative impact on households, due to higher electric bills caused by a rapid transition to retail wheeling, will translate into an overall negative effect on the Texas economy in the near term. This, in turn, will decrease sales tax, utility gross receipts and state franchise tax revenues for governments in Texas;
- Reduced property tax assessments will significantly reduce revenue for many local governments throughout the state; and
- The new structure of local franchise fees for local governments in a competitive environment could have significant implications on local government revenues.

[1] The "regulatory compact" refers to public policy that allows a utility to recover the prudently incurred costs of providing service to all customers in a geographic area, including the reasonable opportunity to earn a reasonable rate of return on investments.

The fact is that unless current tax laws are changed, retail competition in the electric industry will lead to a significant decrease in tax revenues for state and local governments in Texas.

II. THE ROLE OF ELECTRIC UTILITIES IN TEXAS' TAX STRUCTURE

Historically, most of the electricity consumed in Texas has been provided by regulated, investor-owned electric utilities.

Utilities owned by local governments and rural electric cooperatives also have been significant providers of electricity in some parts of the state. Electricity prices charged by regulated, investor-owned utilities are set based on the cost of providing the service. Federal, state, and local taxes are one of many costs that these utilities are permitted to pass through in electric rates paid by consumers. Traditional rate-of-return regulation in essence permits governments to use utilities as tax collectors. Governments have taken advantage of this opportunity to impose special industry taxes on utilities.

New types of electricity providers, known as independent power producers and power marketers, have emerged in recent years. Prices charged by these independent power suppliers are not subject to traditional cost of service regulation. These providers are subject to federal, state, and local taxes, generally on the same basis as ordinary, unregulated businesses. This gives them a tax advantage compared to investor-owned, regulated utilities.

Today, competition at the wholesale level is becoming a dynamic force in the state's electric industry, spurred largely by new gas-fired generation technologies. At both the federal and state levels, changes in legislation and regulations have encouraged the development of increased competition in wholesale electricity markets. At the federal level, the Public Utility Regulatory Policies Act of 1978, the Energy Policy

Act of 1992, and Federal Energy Regulatory Commission ("FERC") Orders Nos. 888 and 889 have sought to introduce increased competition into electric wholesale markets.[1] The 74th Texas Legislature through Senate Bill 373 took a number of additional steps to extend competition at the wholesale level in the state's electric utility industry, including:

- a competitive solicitation process for acquisition of new utility resources;
- creating new categories of wholesale electricity providers -- exempt wholesale generators (EWGs) and power marketers -- allowed to operate in Texas;
- requiring utilities and municipalities to provide transmission service at wholesale to any other utility, qualifying facility, EWG, or power marketer;
- guaranteeing comparable access to wholesale transmission services;
- allowing utilities to offer certain discounted rates that are less than the rates approved by the PUC but above marginal costs;
- allowing EWGs and power marketers to be affiliates of public utilities; and
- allowing distribution cooperatives to opt for partial rate deregulation.

Each of these measures further promotes a competitive wholesale electric market in Texas.[2]

Certain interests, such as unregulated power producers, power marketers and certain large industrial users of electricity, are advocating a public policy change to

[1] Edison Electric Institute Staff, "Summary of the FERC Final Rules on Comparable Open Access, Stranded Cost Recovery, and Same-Time-Information Systems -- Order 888 and 8889", May 1996.

[2] Public Utility Regulatory Act of 1995, 2001(a) and following. See Texas Public Utility Commission Staff Draft, "Report to the 75th Legislature: The Potential for Stranded Investment in the Electric Utility Industry in Texas," Second Staff Draft, (Review Version) October 27, 1996, pp. I-2 and I-3.

permit the generation component of electricity to be sold in a deregulated retail market. This change in public policy will raise significant tax policy issues for state and local governments.

The purpose of this section is to discuss the role that electric utilities have traditionally played in the tax structure in Texas, and the effects that retail wheeling will have on the traditional role of utilities and the state's tax structure.

Taxes/Fees Utilities Must Pay in Texas

State and local utility taxes imposed on electric utilities in Texas include gross receipts taxes, franchise fees, and property taxes.

Utilities are one of only two industries in Texas that are subject to special industry gross receipts taxes (the other being the insurance industry). These include:

- a tax on gross receipts levied to produce general revenue to fund overall state government needs; and
- a special assessment on gross receipts to defray the cost of the state agency that regulates the industry (in the case of electric utilities, the Public Utility Commission).

Special industry taxes are among the oldest type of tax levied in Texas. The current state Constitution specifically authorizes the Legislature to levy "occupation taxes," i.e., taxes that fall on specific industries, reserving one-fourth of the revenue from these taxes for public education purposes. During Texas' early years, special industries coming under some type of exclusive taxation included railroads and telegraph companies, which paid gross receipt taxes, and fixed fees on insurance companies.

The "modern" broad-based utility tax was born in 1907, when the Legislature enacted a tax on the gross receipts of gas, water, and electric utilities. To encourage

the development of utility services in rural areas, the tax was graduated with lower rates for service provided in small towns and population centers, i.e.,

- cities of 1,000 - 2,499 people = 0.581% of gross receipts;
- cities of 2,500 - 9,999 = 1.070% of gross receipts; and
- cities of 10,000 or more = 1.997% of gross receipts.

Texas utility gross receipts taxes average about 1.97 percent.

Utilities in Texas are also subject to the state franchise tax. The franchise tax is based on the higher of two levies: a $2.50 per thousand levy on capital (capital stock and surplus plus undivided profits, i.e., retained earnings); or a 4.5 percent levy on "earned surplus," defined as the sum of prior-year's profits and executives' pay. It is estimated that the total taxes paid to the state (from both the gross receipts and the franchise tax) are roughly the equivalent of a 2.65 percent tax on gross receipts.[3]

In 1977, a special 1/6 of one percent gross receipts tax was enacted to provide for the support of the newly created Public Utility Commission, which was to become the state's electric and telecommunications utility regulatory agency. The tax applies to telephone and electric utilities. Gas utilities, which come under the jurisdiction of the Texas Railroad Commission, are not subject to this tax. The tax generates significantly more revenue than is required to fund PUC operations.[4]

Gross receipts taxes paid by utilities generally are collected from consumers in electric rates. As with most consumption taxes, utility taxes consume a higher

[3] Governor's Office, State of Texas, Report of the Staff Working Group on Property Tax Relief, March 1996, Part II, p. 69.

[4] *Ibid.*

proportion of household income for lower income families; however, it is still the wealthier households that pay the bulk of the tax.

Municipalities in Texas charge a franchise fee to utilities providing services to customers in their jurisdictions. The fees are part of a franchise agreement between the local government and the utility that grants utilities the right to use the municipalities' streets and alleys to provide electric service to customers. The franchise fee amount varies by municipality, and is set by the governing body for each local government. It is usually some set assessment based on a percentage of gross revenues of the utility in that particular jurisdiction.

Utilities in Texas also pay property taxes which are collected by local units of government (school districts, counties, municipalities, and special districts). It is estimated that investor-owned utilities generate in excess of $250 million per year in property taxes associated with generation facilities that are site specific.[6] *These taxes are not spread evenly across all local jurisdictions*, however. The local governments within counties containing such facilities derive a significant proportion of their revenue from property taxes on these facilities.

In addition, much of the tax revenue associated with the property value of generation facilities in these districts are collected and re-distributed to lower property value school districts throughout the state based on the state's public school funding equalization program.

[6] Public Utility Commission of Texas, Report to the 75th Legislature: The Potential for Stranded Investment in the Electric Utility Industry in Texas, Second Staff Draft, 10/27/96, p. V-110 - staff estimate based on ECOM filings from Texas Utilities in PUCT Project No. 15001).

VALUE OF ELECTRIC GENERATION ASSETS IN TEXAS COUNTIES

COUNTY	VALUE OF FACILITY(IES)	INVESTOR-OWNED UTILITY(IES)
Calhoun	$31,449,300	Central Power & Light (CPL)
Cameron	30,802,297	Central Power & Light (CPL)
Chambers	184,883,400	Houston Lighting & Power (HLP)
Cherokee	22,359,960	Texas Utilities Electric Company (TUEC)
Coke	3,828,920	West Texas Utilities (WTU)
Collin	7,728,210	Texas Utilities Electric Company (TUEC)
Crockett	9,616,080	West Texas Utilities (WTU)
Dallas	588,035,395	Texas Utilities Electric Company (TUEC)
El Paso[1]	32,814,570	El Paso Electric Company (EPEC)
Falls	17,942,930	Texas Utilities Electric Company (TUEC)
Fannin	36,411,740	Texas Utilities Electric Company (TUEC)
Fort Bend	938,679,900	Houston Lighting & Power (HLP)
Freestone	119,163,090	Texas Utilities Electric Company (TUEC)
Galveston	279,897,230	Houston Lighting & Power (HLP)
Goliad	163,621,870	Central Power & Light (CPL)
Gray	16,032,050	Southwestern Public Service Company (SPS)
Gregg	42,110,210	Southwestern Electric Power Company (SWEPCO)
Hardeman	4,427,350	West Texas Utilities (WTU)
Harris	860,449,740	Houston Lighting & Power (HLP)
Harrison	282,708,750	Southwestern Electric Power Company (SWEPCO)
Haskell	10,194,330	West Texas Utilities (WTU)
Henderson	56,723,640	Texas Utilities Electric Company (TUEC)
Hidalgo	22,157,770	Central Power & Light (CPL)
Hood	54,646,930	Texas Utilities Electric Company (TUEC)
Lamb	423,457,150	Southwestern Public Service Company (SPS)
Leon	13,872,770	Texas Utilities Electric Company (TUEC)
Limestone	770,177,900	Houston Lighting & Power (HLP)
Lubbock	48,856,690	Southwestern Public Service Company (SPS)
Marion	28,119,420	Southwestern Electric Power Company (SWEPCO)

VALUE OF ELECTRIC GENERATION ASSETS IN TEXAS COUNTIES

COUNTY	VALUE OF FACILITY(IES)	INVESTOR-OWNED UTILITY(IES)
Matagorda	2,382,391,322	Houston Lighting & Power (HLP), Central Power & Light (CPL)
McLennan	54,933,220	Texas Utilities Electric Company (TUEC)
Milam	147,620,160	Texas Utilities Electric Company (TUEC)
Mitchell	42,406,260	Texas Utilities Electric Company (TUEC)
Montgomery	36,869,747	Gulf States Utilities (GSU)
Nueces	227,483,840	Central Power & Light (CPL)
Orange	184,540,290	Gulf States Utilities (GSU)
Potter-Randal	255,811,930	Southwestern Public Service Company (SPS)
Red River	3,921,290	Texas Utilities Electric Company (TUEC)
Robertson	82,158,170	Texas Utilities Electric Company (TUEC)
Rusk	414,286,890	Texas Utilities Electric Company (TUEC)
Somervell	7,756,070,990	Texas Utilities Electric Company (TUEC)
Tarrant	260,733,944	Texas Utilities Electric Company (TUEC)
Taylor	65,687,673	West Texas Utilities (WTU)
Titus	568,321,770	Southwestern Electric Power Company (SWEPCO), Texas Utilities Electric Company (TUEC)
Tom Green	38,616,640	West Texas Utilities (WTU)
Victoria	58,307,510	Central Power & Light (CPL)
Ward	44,054,510	Texas Utilities Electric Company (TUEC)
Webb	42,516,190	Central Power & Light (CPL)
Wilbarger	258,569,900	West Texas Utilities (WTU), Central Power & Light (CPL)
Young	31,947,700	Texas Utilities Electric Company (TUEC)
TOTAL	$18,058,419,538	

Source: Texas Comptroller's Office, Technical Properties, Property Tax Division, January 1995.
Capital Appraisal Group, January 1996.
[1] Appraised value of the Newman power facility only.

In summary, governments have found it relatively easy and convenient to use utilities as tax collectors, since taxes are fully recoverable under cost-of-service regulation, meaning consumers pay the taxes as a part of their electric bill. As a consequence, electric utilities collect and pay significant amounts to government through taxes and fees created specifically for electric utilities at both the state and local level. These taxes represent a significant part of the cost consumers pay to have electric energy provided to them.

Competition in retail electricity markets will result in significantly lower revenues for the state and for local jurisdictions that depend on utility taxes, as demonstrated in this report.

III. THE IMPACT OF RETAIL WHEELING ON TAX REVENUES IN TEXAS

This section of the report estimates the declining government revenues in Texas due to retail wheeling. This analysis is a follow-up to the July 1996 report conducted by Texas Perspectives and MGT of America, *The Potential Economic Impacts of Retail Competition in the Electric Utility Industry in Texas*, which showed how the introduction of immediate retail wheeling would affect jobs and output in the Texas economy. The logic of that model was driven by the fact that electricity is a key and pervasive input to all industrial and service sectors, and an important part of household budgets. Thus, changes in electric utility rates have an effect on economic activity.

Since changes in economic activity directly affect the tax base, the ways in which changes in the electric market affect consumer and business behavior will also filter into tax revenues collected by government. In addition, since both the value of the assets of electric utilities and utilities' revenues are taxed, and because retail competition will effect those value factors, the introduction of competition to electric markets will affect the tax revenues in both those ways as well.

The Model

The logic of the model used for the analysis of the changes in government revenue due to retail wheeling is simple:

1. develop a baseline forecast of how tax revenues may change through 2007 if there *are no changes* in the legal and regulatory environment;

2. make logical assumptions of how tax revenues may change through 2007 if there *are changes* in the legal and regulatory environment, both in terms of utility-unique taxes and fees, as well as tax revenues based on economic activity;

3. compare the levels of output for tax revenues under (2) to a base case (1) in which no changes to the legal and regulatory environment occur.

The logic of this model is very similar to the analytical process used in the June 1996 report regarding the economic impact of retail wheeling in Texas. Now in the context of government revenues, this model permits a reasonable assessment of what may happen to tax revenues in Texas if retail wheeling is permitted in the state.

For our first step, we used a forecast of electric rates that is based on government data from the U.S. Energy Information Administration (EIA.). The EIA has forecast a 0.5 percent increase in real electric prices in the next 10 years, which translates into 2.75 percent increase in nominal terms. For the model used in this report and the previous June 1996 report, the assumption is more conservative than that of the EIA: it is assumed that Texas overall rates will rise by slightly less than 2.5 percent per year. Among the major customer classes:

- residential rates will increase 3.0 percent per year (consistent with overall inflation);
- commercial prices will increase 2.8 percent per year (reflecting slower commercial rate growth in the recent past);
- industrial rates will climb 1.0 percent annually (due to the relatively favorable market position described in previous sections of the report that industrial customers enjoy versus other customer classes);
- the forecast for the "Other" customer group, which is essentially the public sector, is annual increases of 4.3 percent (an extrapolation of the compound growth rate in this segment for the past five years).

These conservative forecasts form the "base case" that is the benchmark from which the following scenarios are compared.

Our next step was to develop a scenario that shows how electric rates may change should retail wheeling be permitted. Our assumption is called the

"Telecommunications Scenario," since it is largely based on price responses to the break-up of the Bell System in 1984.

Telecommunications serves as a good example of how the rate structure of a regulated industry changes when competition is introduced into the market. There are different impacts on various classes of customers. It is our belief that the same can be expected to occur with retail wheeling.

After the deregulation of telecommunications, there was a wide variation in price responses among customer classes. The telephone experience has some clear similarities to electric utilities since the telephone rate classes can be used for comparison purposes to rate classes generally used for analysis of the electric industry. In addition, both the telecommunications and electric industries made large capital investments for infrastructure resources while existing in a regulated environment. These investments were made as a part of the "regulatory compact" requiring guaranteed service and set rates.

The fact is that competitive services in the telephone industry were first available to large business users, since the cost of serving high volume and geographically concentrated customers made it economical for new providers and competitors to seek their business.

A similar dynamic is likely to come into play if competition enters retail electricity markets. The comparison of the telecommunications industry to the electric industry is not perfect, which is why other recently deregulated industries were also considered for the purposes of this analysis, but there are many common elements. The capital intensity of the industry, along with the potential for reduced capital values, means that

residential and small commercial electric customers are likely to experience price increases should retail wheeling be permitted, while larger, concentrated industrial and large commercial users will be the first to experience any significant advantages from deregulation.

Retail competition is likely to come to large users (e.g. industrial customers) of electricity first because of the size of their demand and, in general, their superior negotiating position. An electricity provider stands to gain much more revenue by persuading a large industrial customer to switch suppliers, which gives this new competitor a greater likelihood of recouping the significant capital cost of generating the capacity to serve that customer. This leaves the current provider with less revenue, but an obligation to continue to serve customers with lesser profit potential--typically the residential and small commercial user.

More important, the current provider, just coming out of a regulated environment (with its own set of rules, such as the obligation to serve all users) must pay for the cost of existing facilities from a suddenly smaller revenue base. This need for more revenue from existing customers will put upward pressure on the rates of remaining customers—again, the residential and small commercial customers. (It is important to remember that 86.8 percent of the electric utility customers in the state are residential users, according to the Edison Electric Institute.)

For the construction of our alternative scenario, which attempts to portray the impact of retail wheeling based on the experience of recently deregulated industries, the EIA estimates of kilowatt hour prices are extrapolated for our scenario forecast based on two factors:

- a statistically smoothed out vector of price that is slightly more conservative than the EIA estimates; and
- modifications based on a qualitative assessment of the changes in prices by customer classes for recently deregulated industries.

This results in an annual compound increase in residential electric rates of 4.7% from 1997 through 2007, a 1.6% decrease in commercial rates, a 3.6% decrease in industrial rates and a 2.2 percent increase for government/public sector rates. (The methodological portion of this section will include all data used as input into the model.)

The Tax Implications of Retail Wheeling

The remainder of this section contains our estimates for the potential effect of retail wheeling for a period of ten years on the following types of taxes:

- retail sales;
- utility gross receipts;
- local utility franchise fees;
- state franchise fees; and
- local property taxes.

Each exhibit estimates:

- revenues from each tax assuming no change in the legal or regulatory environment,
- revenues from each tax if retail wheeling is introduced in the electric utility industry in a fashion similar to the alternative scenario discussed above (under which prices change in rate classes in a fashion similar to price changes following telecommunications divestiture), and
- the difference between estimates in the two scenarios.

Retail Sales Tax

Established in 1961, the sales tax is the largest source of tax revenue in Texas; it is projected to provide 56 percent of total state tax revenues in 1997 (totaling approximately $11.3 billion). Nationally, Texas has the third highest state sales tax rate at 6.25 percent, exceeded only by tax rates in Rhode Island, Mississippi, Nevada, and Washington. The tax rate is also 21 percent higher than the national average of 5.16 percent.[1] This significant reliance on sales tax in Texas is an important fact to note, since the higher the effective tax rate, the more significant is the factor of reduced government revenue due to decreases in economic activity caused by retail wheeling.

In addition to the statewide tax rate of 6.25 percent, local entities are authorized to levy a maximum of 2 percent local retail sales tax rate, an option that many communities in Texas have exercised.

The annual growth rate for sales taxes has decreased from 13.5 percent for the period from 1972 through 1983 to 11.1 percent for 1983 through 1992 and is expected to drop to 5.9 percent for the period 1992 through 1997. Since 1972 the tax rates have been increased four times and the tax base has been expanded three times.

Exhibit 1 shows the results of our economic model analysis of the impact of retail wheeling on sales tax revenues. This reduced sales tax revenue is based on the fact that retail wheeling will decrease discretionary funds available to Texas households, due to higher electric rates, and therefore reduce economic activity in the state, producing fewer transactions on which the sales tax would be charged and collected for the state and local governments.

[1] All data for tax revenues, average annual growth rates, and state tax rates are taken from *Sources of Revenue Growth A History of State Taxes in Texas,* published by the Texas Comptroller of Public Accounts in January of 1996. All annual data refer to fiscal years, which run from September 1 through August 31.

These estimates begin for the first year in which it is assumed effective retail wheeling is implemented in the state.

Based on these assumptions, if retail wheeling is introduced into the Texas electric utility industry, the state could lose as much as $58 million in the first full year of retail wheeling and as much as $166 million in the tenth year in sales tax revenues.

Exhibit 1

Potential Effects of Retail Wheeling on Texas Retail Sales Tax Revenues (all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
WITHOUT RETAIL WHEELING	14,251	15,157	16,090	17,139	18,289	19,462	20,707	22,086	23,547	25,089	191,817
WITH RETAIL WHEELING	14,193	15,051	15,949	16,977	18,115	19,282	20,527	21,908	23,372	24,923	190,297
CHANGE IN TAX REVENUE FROM RETAIL WHEELING	**-58**	**-106**	**-141**	**-162**	**-174**	**-180**	**-180**	**-178**	**-175**	**-166**	**-1520**

Source: Texas Economic Impact Analysis Module, 1996.

Utility Gross Receipts Tax

The Texas Legislature first levied a gross receipts on electric utilities in 1907. Utilities are taxed on a graduated basis, depending on the population of the area in which a utility provides service. The utility is taxed at a lower rate for service provided to small towns or population centers. Gross receipts tax rates are levied on the following schedule:

- a rate of 0.581 percent of gross receipts for service to cities with a population of 1,000 to 2,499 people;
- a rate of 1.070 percent of gross receipts for service to cities with a population of 2,500 to 9,999 people; and
- a rate of 1.997 percent of gross receipts for service to cities with a population of 10,000 or more people.

It is assumed that a portion of the state's supply of electricity will be provided by non-traditional sources, in a retail wheeling environment, and these new sources will not be subject to the existing gross utility receipts tax. Market penetration by the non-utility providers is assumed to occur at the following rate: 10% for the first full year, 15% for the second year, and 20% for the third year.

Utilities also pay a special gross receipts tax established in 1977 to provide funding for the Public Utility Commission. The tax rate for this special gross receipts tax is 1/6 of one percent of gross receipts.

The estimates shown in Exhibit 2 begin for the first year in which it is assumed that effective retail wheeling is implemented in the state.

Retail wheeling's effect on the state's utility companies could lead to an estimated revenue loss for Texas in utility gross receipt tax revenues of $16 million in the first year, $27 million in the second year, and eventually growing to a loss of $95 million in the tenth year.

Exhibit 2

Potential Effects of Retail Wheeling on Texas Gross Utility Receipts Tax Revenues
(all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
WITHOUT RETAIL WHEELING	280	292	304	317	330	344	358	374	389	405	3393
WITH RETAIL WHEELING	264	265	260	268	275	281	287	294	302	310	2806
CHANGE IN TAX REVENUE FROM RETAIL WHEELING	**-16**	**-27**	**-44**	**-49**	**-56**	**-63**	**-71**	**-79**	**-87**	**-95**	**-587**

Source: Texas Economic Impact Analysis Module, 1996.

Local Utility Franchise Fees

Municipalities in Texas charge a franchise fee to utilities providing services to customers in their jurisdictions. The fees are part of a franchise agreement between local government and the utility that grants utilities the right to the local government's streets and alleys to provide electric service to customers. Franchise fees vary by municipality, but the amount of franchise fees is set by the governing body of each municipality, and is usually some set assessment based on a percentage of gross revenues of the utility in that particular jurisdiction.

Exhibit 3 shows the potential negative effect of retail wheeling on the revenues to municipalities from electric utility franchise fees statewide. These calculations are based on a 3.29% effective tax rate, with the same assumptions, and increasing rate of penetration of non-utility providers, that was used in the gross utility receipts tax calculations to reflect reduced tax collections.

The estimates shown in Exhibit 3 begin for the first year in which it is assumed that effective retail wheeling is implemented in the state.

Based on these assumptions, retail wheeling could result in a revenue loss of $33 million in the first year for local municipalities throughout the state, $55 million in the second year, and in the tenth year a loss statewide in local franchise fees of up to $196 million.

Exhibit 3

Potential Effects of Retail Wheeling on Local Franchise Fee Revenues (all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
WITHOUT RETAIL WHEELING	577	602	627	653	680	708	738	769	801	835	6990
WITH RETAIL WHEELING	544	547	536	553	566	578	591	606	622	639	5782
CHANGE IN FEE REVENUE FROM RETAIL WHEELING	**-33**	**-55**	**-91**	**-100**	**-114**	**-130**	**-147**	**-163**	**-179**	**-196**	**-1208**

Source: Texas Economic Impact Analysis Module, 1996.

State Franchise Tax

Franchise taxes are levied on businesses based on the higher of two levies: $2.50 per $1,000 of taxable capital (capital stock and surplus, plus undivided profits), or a 4.5 percent surtax on "earned" surplus, which is defined as the prior year's profits plus executives' pay.

Franchise tax revenues should total $1.6 billion (eight percent of total state revenues) in 1997.

Exhibit 4 shows the potential negative effects of retail wheeling on franchise tax revenues for the state. The estimates shown begin for the first year in which it is assumed that effective retail wheeling is implemented in the state.

Based on these assumptions, the State of Texas could lose up to $7 million in franchise tax revenues in the first year of retail wheeling. That revenue loss is projected to increase to as much as $25 million in the tenth year of deregulation.

Exhibit 4

Potential Effects of Retail Wheeling on Texas Franchise Tax Revenues (all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
WITHOUT RETAIL WHEELING	1,628	1,724	1,824	1,932	2,047	2,169	2,299	2,437	2,584	2,746	21,390
WITH RETAIL WHEELING	1,621	1,712	1,807	1,912	2,024	2,145	2,274	2,411	2,558	2,721	21,185
CHANGE IN TAX REVENUE FROM RETAIL WHEELING	**-7**	**-12**	**-17**	**-20**	**-23**	**-24**	**-25**	**-26**	**-26**	**-25**	**-205**

Source: Texas Economic Impact Analysis Module, 1996.

Local Property Tax

Clearly, the most significant impact on government revenues in Texas due to retail wheeling will come in the area of property taxes, since there could be significant decreases in total assessed value of utility company facilities in a competitive market. While some may argue that new generating facilities will overcome any expected reduced valuations, the fact is that when anticipating a truly competitive environment, it is impossible to project whether those new generating facilities will be in the state and subject to state taxes, or located elsewhere.

Property taxes in Texas are levied and collected by local governmental units (school districts, counties, city governments, and special districts such as hospital and municipal utility districts). Like other businesses, utilities pay local property taxes, most of which are paid on the value of generation facilities.

Local governments where electric utility generating facilities are located receive significant portions of their revenues from the property taxes on those generating facilities.

Exhibit 5 shows the potential negative effects of retail wheeling on property tax revenues in Texas. The high, medium, and low estimates account for different estimates of the amount of reduced property tax values under retail competition. As discussed in an earlier section of this report, utilities pay taxes on the value of the real property they own to produce electricity.

A market-based price of electricity, as will be expected in a deregulated environment, will likely result in a reduction of the property values of certain facilities built or acquired prudently under a "regulatory compact" by which utility rates are set to

allow a utility to fully recover its incurred costs. Consequently, the assessed value of that property will fall, and less tax revenue will be generated for those local governments.

The amount of these reductions in property values is difficult to identify precisely, but the Public Utility Commission of Texas has recently made several estimates. Using its expected costs over market value (ECOM) model, the Commission has estimated the expected value of the property value reductions for investor-owned utilities in Texas to be $11.57 billion, with the high-end estimate at $19.23 billion and the low-end estimate at $2.93 billion.

The PUC estimates mean that the amortized cost-of-service for utilities is $11.57 billion greater (in the mid-range estimate) than what utilities would receive in a competitive market. For our analysis, we used the Commission's January 1997 estimates of reduced values to generate the estimated impacts on property tax revenue reported in Exhibit 5.

The PUC calculations are presented in 1996 dollars. The PUC report to the 75th Legislature also presented an expected ECOM amount in 1998 dollars that is $2.3 billion greater than a present value in 1996 dollars. This change represents a 18% increase in ECOM. In addition, the amounts shown above ($11.57 billion) are based on a PUC scenario which assumes a 10% reduction in operating and maintenance expenses. The PUC also provided a calculation of ECOM without this O/M assumption, resulting in an increase in the expected ECOM for investor-owned utilities of $1.2 billion. By using the lower estimate of ECOM amounts, as we have done, the estimates in this report on the impact of retail wheeling on property taxes should be considered conservative.

As this analysis shows, the property tax impacts are likely to be quite significant for local governments throughout Texas, with a revenue loss of $121 million in the first year, $181 million statewide in the second year, and as much as $242 million in the tenth year of retail wheeling, based on a mid-range estimate of the expected amount of lost property value assessment.

Exhibit 5

Potential Effects of Retail Wheeling on Local Property Tax Revenues (all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
LOW CASE	-31	-46	-53	-57	-59	-61	-61	-61	-61	-61	-551
MID CASE	-121	-181	-212	-227	-234	-239	-242	-242	-242	-242	-2182
HIGH CASE	-201	-301	-352	-377	-389	-398	-402	-402	-402	-402	-3626

Source: Texas Economic Impact Analysis Module, 1996.

Total Revenue Impact of Retail Wheeling on Taxes Paid

Exhibit 6 shows the total tax revenue impacts for all types of taxes collected in the State of Texas for ten years following the assumed introduction of retail wheeling. The table shows low, medium, and high cases to reflect the different estimates of potentially dramatic losses in property tax revenues.

The total tax impacts for Texas, spread across all levels of government, could be quite substantial, with tax revenue losses of $234 million in the first year scenario and $382 million in the second year, using the mid-range scenario. In the tenth year the mid-range figure grows to $724 million, with a cumulative total revenue loss of as much as $5.7 billion.

Exhibit 6
Potential Effect of Retail Wheeling on Total Tax Revenues
(all figures in millions of dollars)

	year 1	year 2	year 3	year 4	year 5	year 6	year 7	year 8	year 9	year 10	total
LOW CASE	-144	-246	-346	-389	-425	-459	-485	-507	-528	-543	-4072
MID CASE	-234	-382	-504	-558	-600	-638	-665	-688	-709	-724	-5702
HIGH CASE	-314	-502	-644	-708	-755	-797	-825	-848	-869	-884	-7146

Source: Texas Economic Impact Analysis Module, 1996.

IV. METHODOLOGY AND ASSUMPTIONS UNDERLYING THE MODEL

This section discusses the methodology underlying the model used to estimate tax revenue impacts of retail competition in the electric market in Texas. This includes an explanation of the model of the Texas economy estimating changes in employment and output, upon which we built to estimate changes in tax revenue. Our model is constructed to include the base case for electric rates should there be no change in law or regulation, as well as the alternative case - built upon the experiences of other recently deregulated industries, especially telecommunications - as described in the previous chapter. This section also presents information regarding the tax parameters used for inputs into the tax revenue sector of the model.

As the basis for our analysis, we have selected three economic performance measures:

- employment;
- gross state product in constant 1987 dollars (real output); and
- current dollar gross state product (nominal output).

The analysis utilizes an elaborate network of interconnecting models which enable us to link our forecast of the Texas economy to major international/national macroeconomic developments, specific industry events and local economic growth factors. The base scenario for the Texas economy, covering a ten year period, was based on the latest (November 1996) macroeconomic outlook for the U. S. economy. This forecast was prepared using a large-scale econometric model of the national economy.

The model, which captures the structural interrelationships between the major economic processes, consists of more than one hundred exogenous variables, such as population demographics, fiscal and monetary policy parameters, and international economic factors. Within the model structure, these external variables provide the foundation for projecting more than three hundred different economic series, such as gross domestic product, consumer spending, business outlays for plant and equipment, exports, imports, government purchases, inflation, unemployment.

Given these estimates of the major components of national economic activity, an input/output (I/O) model is used to forecast the implications for economic activity in different industries. Because of interdependencies among the industries, the growth of any single industry cannot be studied in isolation. For example, a rise in demand for automobiles would increase the demand for steel, which would, in turn, increase the demand for coal. Conversely, the growth of the coal industry depends not only upon the growth of the steel industry in an input, but also automobiles and other industries which use steel as an input. The I/O approach is best suited to take explicit account of the direct as well indirect relationships among these different industries.

The basic parameters of any I/O model are derived from a set of identities known as the transaction tables. These tables show the flow of goods and services among different industries and the flows to each industry's final users (households, businesses, exporters, importers, and governments). These identities also show the link between the broad Gross Domestic Product components and the demand for individual industry products.

Every firm can be examined from two points of view. First, as a producer of the output it sells to other firms and to the final users of its products, and second, as a user of the inputs it buys from other firms and the primary factors of production it purchases (labor, land, capital, etc.). If all business firms, households, and governments are grouped into industries, the same two-fold market structure holds. Industries buy in one range of markets and sell in another set. The I/O transaction tables show these dual market relationships among all industries in the economy.

Each row of the main transaction table shows the sales distribution of a given industry's output to every other industry and to each of the major final users (households, businesses, exporters, importers, and the public sector) in the economy. Meanwhile, each column of the table shows the distribution of a given industry's purchases of materials from other industries and the use of primary factors of production.

The national projections of economic activity by individual industry are then translated into similar projections at the regional level. Such conversion is achieved through the use of a system of econometric functions which distribute the national industry forecast across each of the states using past geographic performance trends and current regional factors. The process is designed to ensure that the sum of state projections for each major industry group matches the national view. Thus, each state's economic profile is made consistent with national economic conditions, with individual industry developments, and with other regional economies. The regional outlook reflects the industry composition of the local economy a well as specific local growth characteristics.

The Economic Impact Analysis Module used in the June 1996 report and this one assume that all proposed legislative and regulatory initiatives can be translated into changes in rate schedules from the base track for each of the four major customer groups. The module allows for "input" of the alternative fee structures for a ten year period, providing the foundation for developing alternative growth scenarios for the Texas economy. The analysis focuses on three major economic players - (1) the household or residential sector, (2) the business sector (commercial/industrial), and (3) the "other," or public (government) sector. The following table shows the input values for the baseline case and the alternative scenario.

Exhibit 7
Inputs for the Base Case and the Alternative Scenario

BASE CASE	Year	Residential	Commercial	Industrial	Other
	1997	8.85	7.60	4.43	7.72
	1998	9.12	7.71	4.47	7.89
	1999	9.39	7.88	4.52	8.06
	2000	9.67	8.04	4.56	8.23
	2001	9.96	8.21	4.61	8.41
	2002	10.26	8.38	4.66	8.59
	2003	10.57	8.56	4.70	8.77
	2004	10.89	8.74	4.75	8.96
	2005	11.21	9.11	4.80	9.15
	2006	11.55	9.30	4.85	9.35
	2007	11.89	9.50	4.90	9.55
ALTERNATIVE SCENARIO	**Year**	**Residential**	**Commercial**	**Industrial**	**Other**
	1997	9.98	7.68	4.23	7.72
	1998	11.15	7.74	3.95	7.89
	1999	12.01	7.65	3.63	8.06
	2000	12.63	7.46	3.36	8.23
	2001	13.04	7.24	3.14	8.41
	2002	13.27	7.02	3.00	8.59
	2003	13.50	6.84	2.93	8.77
	2004	13.71	6.70	2.93	8.96
	2005	13.92	6.59	2.93	9.15
	2006	14.11	6.56	2.93	9.35
	2007	14.31	6.54	2.93	9.55

The economic impacts within the business sector are evaluated by type of industry, since electric energy usage and costs vary significantly across industries. Data on individual industry usage comes from RIMS II (Regional Input/Output Modeling System), a regional input/output model originally developed by the U.S. Department of Commerce to analyze regional economies. While the theory underlying the regional I/O process is identical to the national model discussed above, the use of national statistics could seriously distort estimates of the economic impacts of a given regional industry on the local community. The national technical coefficients (the proportion of material purchased by an industry to its total output) must be adjusted to reflect the local presence of industries. While the national matrix tells us how an industry produces its output, the key regional question is how much of these industry-to-industry purchases are handled by local business -- the higher the proportion, the bigger the impact on the local economy. For example, the steel industry must buy coal to run its mills. However, if coal production is not local, a portion of the economic stimulus from higher steel output will be transferred out of the local area. Regional I/O tables provide a fairly accurate picture of local business conditions and industry-to-industry relationships in the community.

For each industry, a composite electric rate structure was estimated by combining the commercial and industrial rate schedules. Computational weights were estimated from U. S. Census Bureau data detailing the size distribution of business establishments in Texas by major industry. Within each industry, the percentage of large industrial users was estimated, while the residual percentage specified the relative importance of commercial users. Although business accounts are theoretically determined by the

industry of the client, many utilities regularly redefine large commercial customers as industrial users, while moving small industrial users to the commercial category and treating small business customers in a similar fashion to residential users. Our analysis tries to capture that phenomenon.

The change in each industry's cost of production stemming from a shift in electric rates is estimated by using the industry's composite electric rate in conjunction with the technical coefficient from the regional input/output table which indicates the relative importance of electric purchases to total industry shipments. For example, a 10% reduction in the electric costs to an industry where electric utility purchases represent 20% of total value of industry sales would yield an estimated 2% reduction in the user-industry's cost structure. We assume that the technical coefficient for electric usage in each industry remains relatively stable (electric energy consumption moves in tandem with changes in the volume of industry production).

Since the vast majority of industries serve markets in which its customers display a fair degree of price sensitivity, we assumed that each industry would lower its product prices in line with reduced production costs. Along these same lines, a conservative position would be to assume that the behavior of buyers would exhibit, on average, a unitary price elasticity of demand in final user markets. That is, a 1% change in price would result in a 1% change, in the opposite direction, in the quantity demanded. These calculations yield the direct changes in real economic activity by major industry group generated by shifts in electric rates paid by the business sector.

The residential user represents a significant market for the electric utility industry. Our analysis of changes in household usage relies heavily on some major work done

several years ago in consumer behavior theory. In general, consumers are not very sensitive to changes in electric rates due to the necessity of the product and the lack of acceptable alternatives (substitutes). Based on past research findings, we assumed the price elasticity of demand form electric services by households is equal to 0.15 in the short-term, gradually increasing to 0.25 over the longer-term. Such an elasticity implies that for each 1% increase in prices, consumers reduce their usage by 0.15%. In addition, we assumed that any increase in electric bills would be accompanied by an amount of decline in other consumer purchases, keeping the implicit personal saving rate unchanged. The reduction in other consumer purchases were then distributed across other product markets using data from the Texas I/O model on the composition of household spending.

The model assumes that government users would not change their volume of electric usage as a result a change in electric rates. The nature of the use of electricity by public sector agencies suggest that such an assumption is reasonable. Therefore, the total direct effects on real economic activity by industry stemming from a change in utility fee structures can be summarized by adding together those shifts in consumer behavior discussed above to the changes discussed earlier that are generated by changing production costs, industry product pricing actions, and finally, the reactions of buyers of those products.

A system of regional input/output multipliers was used for this study to assess the total (direct and indirect) changes associated with new legislative and regulatory reform initiatives. The direct effects are only the first wave of economic changes. There are four separate effects which collectively account more fully for the regional economic

repercussions of producing a dollar's worth of output in a given industry. These effects are: (1) change in output for a given industry needed to meet the initial dollar change in spending by the final users; (2) changes in the output of other industries to meet the direct requirements of a given industry; (3) changes in the output of all industries to meet the changes in production in (2) above; and (4) the regional production required to meet changes in demand by final users created by higher local income generated by the first three effects.

These regional impact factors, which are used to capture the total economic effects by industry, are based on research conducted by the U. S. Bureau of Economic Analysis. We selected two sets of multipliers from RIMS II product - (1) output multipliers and (2) employment multipliers. Each multiplier is represented by a matrix of impact factors. Each column of the matrix contains multipliers which indicate the impact of a change in a given industry's activity (column) on each of the regional industries (rows). Each element of the output multiplier matrix shows the total (direct and indirect) changes in the row industry output for each additional dollar of output in the column industry delivered to final users. For example, the element in the steel industry row and the automotive industry column indicates the total change in steel industry production from direct and indirect effects of a dollar change in constant 1987 dollar demand for automobiles. Multiplying the direct effect on industry demand from changing electric rates by the corresponding column in the output multiplier matrix, and summing these calculated changes across the columns for each row will yield the ultimate change in each industry's real output. Current dollar output changes are estimated from the industry's change in production times the shift in each industry's product price.

The total impact on employment by industry is calculated in a similar manner to the change in real industry output. Employment is linked to production levels. Elements of the employment multiplier matrix indicate the number of full and part-time jobs that the regional row industry provides, both directly and indirectly, in order for a given column industry to deliver an additional $1 million of constant 1987 dollar output. Multiplying each direct change in a given industry's output by the column of the employment multiplier matrix, and summing across the columns for each row industry, provides the total change in each industry's employment.

The tax sector of the model provides a linkage between changes in public sector tax receipts and general economic developments at the state level and specific industry changes in the electricity sector. For Texas, there are five key taxes we examined which will be impacted by the deregulation of the electric industry:

- retail sales taxes;
- the gross utility receipts tax;
- local utility franchise fees;
- the state franchise tax; and
- local property taxes.

The statutory sales tax rate in Texas is 8.25% (6.25% statewide plus the maximum 2% local retail sales tax permitted by state law.) The statutory rate is adjusted to handle exclusions and then linked to the current dollar level of Gross State Product.

The gross utility receipts tax rate of 1.997% is applied to an estimate of electric utility revenues. The latter is projected forward from actual 1995 industry sales (based on U.S. Federal Energy Administration data) using the assumed electricity price scenarios and the associated levels of general economic activity. Under deregulation, we assumed that a

portion of the electricity supply would be provided by non-traditional sources which would not be subject to the industry's gross receipts tax. The market penetration of these non-utility providers is assumed to be 10% in the first year, 15% in the second year and 20% in year three and beyond.

An estimate for local utility franchise fees was generated by applying a 3.29% effective tax rate to the projected level of industry revenues described above. The same assumptions regarding the loss of market share by traditional utility companies are used to derive lower these tax receipts in a deregulated market environment.

The state franchise tax revenue is linked to the level of economic activity (in current prices.) The 4.5% statutory rate is adjusted for each of the nine individual major industry groups to reflect the past relationship between corporate earning and business activity. The nine industry segments are: agriculture; mining; construction; manufacturing; transportation, communications and utilities; wholesale trade; retail trade; finance, insurance and real estate; and services.

The property tax loss calculation is tied to the amount and the distribution over time of the reduction in property values caused during a near term transition to retail wheeling. An effective mil rate of 2.09% is used. To calculate the property tax impact, we assumed that the reduction in property tax values is equal to the amount of ECOM, as recently estimated by the Texas Public Utility Commission. We used low-range, mid-range and high-range estimates from the January 1997 PUC report entitled, "The Potential for Stranded Investment in the Electric Utility Industry in Texas."

Fifty percent of the decrease attributable to lost property value assessments are reflected in the first year of retail competition, an additional 25% in the second year, 12.5%

in the third year, 6.25% in the fourth year, 3% in the fifth year, 2.25% in the sixth year, and 1% in the seventh year. The percentages total to 100% over seven years.